

Remarks

Reconsideration and reversal of the rejections expressed in the Office Action of July 22, 2003, are respectfully requested in view of the following remarks and the application as amended. The present invention relates to methods and devices for detecting the interaction of single molecules with surface-bound reagents. The methods utilize synchronized techniques for controlling the interaction between labeled molecules in a flowing solution with reagents supported on a surface, and incorporate optical detection techniques, such as fluorescence measurements.

Claims 1-16 were rejected under 35 U.S.C. §112, second paragraph. The claims have been clarified to overcome this rejection.

Claims 1-4 and 9-16 were rejected under 35 U.S.C. §102(e) as being anticipated by Quake et al. This reference discloses methods for high speed, high throughput analysis of polynucleotide sequences, and apparatuses with which to carry out those methods.

Quake et al discloses the use of a scanner system to effectively read out the optical signals from the synthesis channels in an image format. Note that this is a slow process; Quake et al. do not discuss any requirement for synchronization of the read out of the optical signal with the introduction of the "wash solution" There is no teaching or suggestion in Quake et al. that their "detection step" (i.e., scan with the scanner) must be performed "substantially simultaneously" with their "wash/flush step."

In contrast, as disclosed and claimed in the present application, the light source, or the detector must be switched on "substantially simultaneously" with the step (f) of switching or redirecting the flowing solutions or the location of the supported reagent. Therefore, this rejection is overcome.

Claims 1-15 were rejected under 35 U.S.C. §102(e) as being anticipated by Williams, U.S. Patent No. 6,255,083. The claims as amended overcome this rejection as well.

Claims 5-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Quake et al. in view of Williams. The Office Action states, inter alia, that it would have been obvious to modify the labeled molecule concentration of Quake et al. to obtain concentrations above 10^{-5} M as claimed.

Note that the invention as presently claimed includes the clarification that a single chemical reaction is detected by detecting the presence of a single labeled molecule that has participated in the chemical reaction by the step of detecting light emitted at a particular illumination zone, with the concentration of the label molecules being above 10^{-8} M. Such aspects are neither taught nor suggested by the Quake and Williams references, either alone or in combination. Thus, prima facie obviousness is not established.

Claims 1-15 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 3-14 of application No. 10/059,754. As the '754 application has been abandoned, this rejection is no longer applicable.

For all of the above reasons, it is respectfully contended that the solicited claims define patentable subject matter. Reconsideration and reversal of the rejections expressed in the Office Action of July 22, 2003 are respectfully submitted. The Examiner is invited to call the undersigned if any questions arise during the course of reconsideration of this matter.

Respectfully submitted,

Date: 12/22/03

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